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ABSTRACT

Considerable research has focused on comparative studies of open and traditional classrooms which have used standardized test scores as well as measurements of self-perception, creativity, adjustment to school, classroom structure, and teacher control. This paper briefly reviews some of these research findings and discusses the implications of these findings for school administrators. (MP)

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OPEN EDUCATION AND STUDENT PERFORMANCE

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What type of classroom environment is best for learning? What factors produce the greatest pupil growth in basic academic skills? Such questions are at the very foundation of much educational debate today, as they probably have been since schools were invented. Advocates of all sorts produce varied arguments to support their views. The recent public concern over pupil achievement as measured by standardized tests has further fueled this ongoing debate. The adoption by many districts of competency tests and promotion policies based on achievement scores indicates the widespread political support enjoyed by such measurements of achievement.

Knowledgeable educators recognize the limited usefulness of standardized test scores as accurate indicators of learning and growth. However, they do represent a form of measurement which many people can relate to. Political efforts to insure educational accountability tend to focus on standardized tests as a measure of tangible results. Learning and growth are difficult to measure , at best and there are no substitutes for standardized tests which are likely to gain public acceptance as measures of achievement in the near future. Thus, when one seeks to answer the questions posed initially, it is to traditional forms of measuring achievement that one turns to examine alternative educational forms.

In recent years much attention has been focused on open education (with varying definitions) as an alternative to the traditional system of education, especially in elementary schools. Advocates of the open classroom argue that it better meets the varied learning needs of

children, thus fostering their growth, development, and learning. Proponents of traditional forms of classroom organization feel that achievement in basic skills areas is greater in a more conventional setting.

Considerable research has focused on comparisons of open and traditional classrooms using standardized test scores as well as measurements of self-perception, creativity, adjustment to school, etc. It is the purpose of this paper to take a brief look at a sample of recent writings regarding research on open education and closely related topics. This is by no means a thorough examination of the existing literature, it is vast. However, even a brief look at this topic raises questions of considerable interest to administrators. There are implications which cannot be overlooked as we strive to improve our efforts in educating young children. Before considering some of these implications, let us review some of the relevant research.

Although it has been the object of renewed interest in recent years, open education is by no means an entirely new movement. Researchers in the 1930's and 1940's examined pupils in "progressive" schools and found that, while they scored slightly lower in reading and arithmetic achievement, they surpassed the control group in knowledge of current affairs, progressive social beliefs, and personal adjustment. The "progressive" pupils also showed more evidence of initiative, experimentation, cooperation, and leadership.[1]

Interest continued into the 1950's and 60's. In 1969 the Bank Street College of Education conducted a study of nine year old students in schools which ranged from very traditional to very "modern". The study was seriously flawed by the fact that the most "modern" school studied was a rather unusual and expensive private school. However, the results are of some interest to our present review. In general, no significant differences were found between modern and traditional

schools in group tests of academic achievement, problem-solving, and imaginative thinking. The open school children exhibited more differentiated self-concepts and more positive attitudes toward school.[2]

The Gardner studies conducted at the University of London (1942, 1950, 1966) represent important long-term investigations of the effects of open education. They have methodological flaws and are statistically unsophisticated by present standards; however, their findings were similar to recent American results which show little difference between informal and traditional schools on measures of academic achievement and numerous advantages for informal schools on other variables. The only area in which more formal schools showed superiority was arithmetic.[3]

After reviewing the historical research, Robert Horwitz provided a descriptive analysis of more than two hundred studies on open education. He found that there is still no clear answer to the question of whether or not the open classroom is significantly more beneficial to children than traditional teaching approaches. Conflicting findings have emerged for most variables assessed. Many variables considered important by advocates of open education have not been properly evaluated because of difficulties in measurement. Research is also hindered by ambiguity surrounding the definition of an open classroom. There is, however, at least a general understanding that it refers to a style of teaching involving flexibility of space, student choice of activity, richness of learning materials, integration of curriculum areas, and more individual or small-group than large-group instruction.[4]

Horwitz used a "box score" approach to classify the studies he surveyed into four categories based on the results: 1) significantly favoring open education, 2) significantly favoring traditional teaching,

3) no significant differences, and 4) mixed results. This gives an estimate of the direction of the relationship between the independent and dependent variables.[5] For ease of review, I have chosen to summarize Horwitz's findings in tabular form. (see. Fig. 1).

CATEGORY	NO. OF STUDIES	FAVORING OPEN SCHOOLS	FAVORING TRADITIONAL SCHOOLS	MIXED RESULTS	NO SIGNIFICANT DIFFERENCES
Academic Achievement	102	14	12	29	47
Self-Concept	61	15	2	15	29
Attitude Toward School	57	23	2	14	18
Creativity *	33	12		10	11
Independence and Conformity	23	18	1	2	2
Curiosity *	14	6		5	3
Anxiety (less)	17	3	5	1	8
Personal Adjustment	22	7		11	4
Internal Control	24	6	1	4	13
Cooperation	9	6		1	2

FIGURE 1.

* Results in these categories are of dubious value because of inadequacies of definition and measurement.

While pointing out the need for further research and alternate forms of evaluation, Horwitz notes an overall impression that the open classroom sometimes has measureable advantages for children, sometimes makes no measureable difference, and rarely produces evidence of harm. However, inconsistencies of definition and variations in studies (age levels, instruments, etc.) qualify these impressions.[6]

Donna Hetzel sought to further quantify Horwitz's findings through "mega-analyses" (Glass, et. al 1976). These are attempts to make sense of findings which are "fragile...(which) vary in confusing irregularity across contexts, classes of subjects, and countless other factors."[7] For example, effect sizes can be computed by subtracting the mean on the outcome variable of the control group from the mean on the same outcome variable of the experimental group and dividing the result by the standard deviation of the control group. This indicates the strength or importance of the effect rather than only the direction.[8] Hetzel computed effect size for all available results of studies located through an exhaustive search of literature on the effects of open education. She also analyzed studies by sign(which group is higher on the outcome measure.) When the analysis was complete and T-tests were conducted, the results indicated that while open education appeared to have slightly higher outcomes on average than did traditional education, the difference was not significant and was likely to have occurred by chance. The only specific outcome that was significant by itself was self-concept. The conclusion was that open education showed a very slight and non-significant advantage overall that did not differ across sample, operational, and methodological characteristics of the studies.[9]

While noting that many studies of open education are seriously flawed methodologically, Hetzel also expressed doubt that a great

number of additional well-designed studies would show different results. She feels that open education is a viable option for schools.

Robert A. Hayes and Barbara Day conducted an interesting study of third grade pupils in North Carolina. Their intent was to examine the relationships between the degree of classroom openness and basic skills, self perceptions and school attendance. The subjects were 1,648 third grade pupils in 96 classrooms in 18 public elementary schools in North Carolina. The schools selected were those which had state-funded kindergartens in 1970-71 (The study was done in 1973-74 so this insured equal years of schooling). Classroom openness was defined by the Walberg-Thomas Observation scale and parallel teacher questionnaires. Achievement was measured by Iowa Tests of Basic Skills, Level 8, Form 5, while self-perceptions were measured by the Primary Level Self-observation Scale. Basic background information was also collected on students and teachers.[10] Regression analyses of the data collected revealed no statistically significant relationships between the degree of classroom openness and any of the basic skills, the self-perceptions, or the school attendance records. The results supported the assertion that pupils in open classrooms master the basic skills just as well as pupils in more traditional classrooms; however, they did not uphold the assertion that open classroom pupils develop more positive self-perceptions.[11]

Some research on open education has focused not only on the program of instruction, but also on the physical classroom space. Ann Lukasevich and Roland Gray considered both factors in a study of ten schools in Vancouver, Canada. Using the Dimensions of Schooling Questionnaire as a measurement of openness in program, the ten schools were grouped in four categories: open space/open program (3 schools); open space/non-open program(2 schools); traditional space/open program (3 schools);

traditional space/non-open program (2 schools). School achievement and self-concept data were gathered for 321 third graders. Intelligence, socioeconomic status, and sex were used as covariates in analysis of data. Significance tests were performed to test for the interaction of program and facility with each other and in combination with one or more of the individual difference variables alone or in combination with one another.[12]

Thirteen variables were considered (four measures of achievement and nine measures of self-concept). There were significant differences between the groups for only five of the thirteen variables. Mathematics concepts scores were highest when students were taught in a non-open program in traditional facilities. Reading comprehension scores favored students in non-open programs. Students in open facilities had better self concepts related to school subjects. A disordinal interaction was found in tests of convergent mental ability and social virtues. Open programs produced better scores than non-open programs when in traditional facilities, while non-open programs scored better when in open facilities. Interaction between intelligence, socioeconomic status, and sex and the school variables was not significant.[13]

Generally speaking, the results of this study were somewhat confusing and difficult to interpret. Apparently further research is needed to clarify results.

The experience of the Phillips Extended Day School in Raleigh, N.C. is also of interest when one considers studies of the effects of open education. When state test results for 1977-78 and 1978-79 were considered the average scores for children in the extended day program were higher than the average scores for non-extended day children in

both reading and mathematics. The difference in group mean scores widened from the first to the second year. This is of interest because the extended day program was essentially an open educational approach. Of course, the extended day children were also exposed to concepts over a longer period and in a greater variety of ways.[14]

Of particular interest is the possible correlation between the "hands-on" experimental approach to mathematics in the extended day program and the significantly higher extended day group scores in mathematics.[15] Since other studies seem to indicate that students in traditional programs exhibit higher achievement in mathematics, this line might well warrant closer examination in follow-up studies of the program at Phillips.

Closely related to the question of open vs. traditional education is the concept of classroom structure and teacher control. The amount of formal structure in a classroom has often been conceptualized as the degree of control maintained by the teacher over classroom activities.[16]

Thomas L. Morrison undertook a study of structure in elementary school classrooms and its relationship to work involvement and social climate. Using behavioral observations, Morrison made a two dimensional measure of classroom structure: 1) the amount of interactive activity in the classroom and 2) the proportion of such activity explicitly controlled by the teacher. He dealt with the effects of structure on classroom groups in the context of traditional elementary schools during the middle of the academic year. His assumption was that if structure in this context serves primarily to reduce uncertainty, then the more highly structured classrooms would be characterized by more task involvement and a more comfortable social climate. Conversely,

if structure produces resentment then the more highly structured classrooms would have a less desireable social climate and there might be more passive resistance to task involvement. The study also considered the relationship between pupil anxiety and classroom structure.[17]

Observations were made in 32 classrooms (grades 4,5, and6). Pupil activity and teacher control behaviors were recorded. Classrooms were divided on the basis of degrees of activity and control. Children's perceptions of classroom social climate were measured by My Class Inventory (Anderson 1971), an elementary modification of Walberg's Learning Environment Inventory. Anxiety was measured by the Test Anxiety Scale for Children. Relationships of classroom structure to both work involvement and social climate were assessed by two-way analyses of variance (amount of activity and proportion of control). Effects of child anxiety and sex of child were also assessed.[18]

The overall results of the study indicated that in the context of traditionally organized elementary schools, the most highly structured classrooms contained the highest amounts of work involvement. Apparently this was at no cost to classroom social climate. There were no statistically significant differences in student-reported satisfaction and high structure classrooms were among groups with higher intimacy and lower friction. There were some effects indicating less work involvement for boys and boys reported finding their work more difficult. (Analysis of the percentage of boys in the sample from each classroom showed that this percentage did not differ significantly across conditions.) [19]

One striking finding was in the area of child anxiety. Highly anxious children did experience school somewhat differently from their

low-anxious peers; however, they did not behave differently and did not respond differently to different conditions of structure.(Note: Test Anxiety was the measurement taken.).[20]

Morrison's findings are consistent with the hypothesis that teacher provided structure is positively regarded by the students and reduces the potential for confusion and anxiety in the group. Energy was freed for constructive work. The anxiety test results belay criticisms that work involvement is coerced in highly structured classrooms.[21]

Morrison noted that his results could not be generalized beyond traditional classrooms in middle class environments. It would be most useful if similar research were available for classrooms based on open organization. (The fact that none were located may well be a factor of time limitations in preparing this report.) Indeed, advocates of open education note that such classrooms are highly organized though the basis of their structure may be entirely different from that of a traditional classroom and teacher control may be exercised in a different manner. The benefits of structure may well exist in both environments.

An informal study conducted by Elliott Seif approaches this issue. Unfortunately, Seif did not present test data to support his views. However, his descriptive report is of interest. Seif sought to identify characteristics of teachers whose classrooms had an "atmosphere of learning and growth--the feeling that learning is occurring, often unmeasured by traditional achievement tests."[22]

In interviews with eight such teachers in elementary schools in inner-city Philadelphia, Seif found that they emphasized the following goals for their students: 1) developement of a sense of personal adequacy,

2) multi-facted self-expression, 3)greater responsibility for their own learning, 4) interdependence, and 5) development of basic academic skills. The classrooms were generally characterized by a highly structured, yet informal style of teaching. Considerable time was spent diagnosing student needs at the beginning of each year. [23] Had Seif applied measurements to his observations, his study might well have paralleled Morrison's efforts.

Where are we left when the implications of this research are considered? The results do not establish the clear superiority of either open or traditional education where academic achievement is concerned. Results in areas of self-concept, while not unanimous, do tend to favor open education. Is further research warranted? In some areas such as effects of classroom structure this seems necessary. In other respects it is doubtful that future research results would be more convincing. What may well be needed are new instruments which can better evaluate certain aspects of open education such as creativity, curiosity, etc. It might well be beneficial to conduct long term research on the long-range effects of good self-concept on student achievement. Meanwhile ...

> Unfortunately, the mixed pattern of findings on achievement is such that advocates of open education will always be able to cite studies in favor of the open approach, while detractors will always be able to cite evidence against it. As with so many public policy issues, the decision about whether or not to support the open classroom therefore ultimately becomes one of values, not science.[24]

School administrators concerned with developing productive school environments must search their own values and build on the strengths of their staffs to meet student needs. Their dilemma is heightened by research regarding factors affecting academic performance and the influence exerted by administrators.

Kenneth M. Matthews, noted that academic performance is a function of the interactive effects of ability, external resources, and effort.[25]

> The complexities of interactive effects among factors affecting academic performance and differential effects of specific acts on factors affecting academic performance offer little hope of specific variants of schooling yielding consistent results. If teaching is accepted as an art and learning as a highly individualized process, then conceptual foundations are the best tools available to educators for the improvement of academic performance.[26]

In conclusion, I would like to briefly examine a study conducted by Terrence Deal and Lynn Celotti. It has broad implications for administrators who might choose to promote open education in their schools. Deal and Celotti researched 34 varied school districts in the San Francisco Bay area (1973-1975). They used interviews and questionnaires to focus on two aspects of classrooms: individualized instruction and team teaching.[27] They found that two factors produced higher levels of individualized instruction between 1973 and 1975: 1) open space architecture and 2) a state reform effort--California's Early Childhood Education Program. Factors that did not have an impact included: 1) organization of the classroom (aides, volunteers, teams, etc.); 2) organization or administrative features of the school (size, specialists, policies, administrative style); and 3) district-level characteristics (size, wealth, leadership style, etc.) [28]

The implications are quite significant. Administrators cannot rely upon traditional assumptions of organizational cohesion to produce change in schools. Rather, administrative influence on classroom instruction may affect classroom teaching in less formal, less tangible ways. The role of the administrator as a senior colleague and symbolic leader may be enhanced.[29]

In the final analysis, administrators must know the type of learning environment they wish to foster. The choice may well be

influenced by factors such as community mores and architectural styles; however, whatever approach is used the ultimate test lies in meeting the needs of children--fostering growth, development, and learning. When change seems indicated it cannot be dictated. The challenge to educators is to lead through informal influence. Can any other profession be regarded as more demanding?

FOOTNOTES

[1] Robert Horwitz,"Psychological Effects of the 'Open Classroom'," Review of Educational Research 49(Winter 1979): 73.

[2] Ibid., p. 74.

[3] Ibid.

[4] Ibid., p.71-72.

[5] Donna C. Hetzel. A Quantitative Synthesis of the Effects of Open Education. (Bethesda, Md.:ERIC Document Reproduction Service, ED 191-902, 1980),p. 4.

[6] Horwitz, "Psychological Effects", p. 80.

[7] Hetzel, "Quantitative Synthesis", p. 3.

[8] Ibid., p. 4.

[9] Ibid., p.8-11.

[10] Robert K. Hayes & Barbara Day,"Classroom Openness and the Basic Skills, the Self-Perceptions, and the School Attendance Records of Third Grade Pupils," The Elementary School Journal 81(November 1980): 89.

[11] Ibid., p. 92.

[12] Ann Lukasevich & Roland Gray,"Open Space, Open Education, and Pupil Performance," The Elementary School Journal 79 (November 1978): 109-111.

[13] Ibid., p. 112.

[14] Mary E. Mayesky,"Phillips Extended Day Magnet: A Successful Blend of Day Care and Academics," Educational Horizons 58(Sunner 1980): 180-182.

[15] Ibid.,p.183.

[16] Thomas L. Morrison,"Classroom Structure, Work Involvement, and Social Climate in Elementary School Classrooms." Journal of Educational Psychology 71 (August 1979): 471.

[17]Ibid., p. 472.

[18]Ibid., p. 474.

[19]Ibid., p. 475.

[20]Ibid.

[21]Ibid.

[22]Elliott Seif," What Are Teachers Like Who Use a Personalized Approach?" Educational Leadership 37 (December 1979): 262.

[23]Ibid., p. 263.

[24]Horwitz,"Psychological Effects", p. 83.

[25]Kenneth M. Matthews," Improving Academic Performance," The Educational Forum XLIV (November 1979): 65.

[26]Ibid., p. 67.

[27]Terrence Deal & Lynn Celotti," How Much Influence Do (and Can) Educational Administrators Have on Classrooms." Phi Delta Kappan 61 (March 1980): 471.

[28]Ibid., p. 471-472.

[29]Ibid., p. 473.

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